

CLAIMS

1. A packet switching system comprising:  
a switch fabric having a cross-point switch,  
wherein a cross-point buffer is located at each cross-point of the cross-point switch, and a plurality of actual available queue space tables (AAQSTs), each identifying the actual queue space available in a set of the cross-point buffers; and  
a plurality of line cards, each coupled to the switch fabric, and each having an input buffer, an output buffer, and a predicted available queue space table (PAQST) identifying predicted queue space available in a set of the cross-point buffers.
2. The packet switching system of Claim 1, wherein each of the cross-point buffers comprises a plurality of cross-point queues.
3. The packet switching system of Claim 2, wherein each of the cross-point queues in a cross-point buffer supports a different quality of service class.
4. The packet switching system of Claim 1, wherein each of the cross-point buffers includes one or more entries.
5. The packet switching system of Claim 1, wherein each line card further comprises a line card function for converting an input data packet having a first format into one or more internal frames having a second format.

6. The packet switching system of Claim 5, wherein the second format includes a user switching tag followed by a data payload.

7. The packet switching system of Claim 6, wherein each of the internal frames has a maximum length L.

8. The packet switching system of Claim 7, wherein the line card function is configured to generate variable length internal frames.

9. The packet switching system of Claim 5, wherein each of the line card functions is configured to maintain a corresponding PAQST.

10. The packet switching system of Claim 1, further comprising means for modifying an entry of a PAQST of a line card when the line card transmits an internal frame to the switch fabric.

11. The packet switching system of Claim 1, wherein the switch fabric comprises means for modifying an entry of an AAQST when the switch fabric receives an internal frame from a line card.

12. The packet switching system of Claim 1, wherein the switch fabric comprises means for modifying an entry of an AAQST when the switch fabric transmits an internal frame to a line card.

13. The packet switching system of Claim 1, wherein the switch fabric comprises means for transmitting an update

signal for modifying a PAQST in a line card when the switch fabric transmits an internal frame to the line card.

14. The packet switching system of Claim 1, wherein each line card further comprises means for periodically transmitting an update request to the switch fabric.

15. The packet switching system of Claim 14, further comprising means for transmitting an AAQST from the switch fabric to a line card in response to an update request.

16. The packet switching system of Claim 15, wherein each line card further comprises means for updating the corresponding PAQST in response to an AAQST transmitted by the switch fabric.

17. The packet switching system of Claim 1, wherein each line card further comprises:

an egress queue management circuit for monitoring the corresponding output buffer in the line card, and asserting an egress congestion indication signal when the output buffer in the line card is nearly full and unable to store more data from the switch fabric because a receive rate of the line card is greater than a transmit rate of the line card; and

a transmit control circuit coupled to receive the egress congestion indication signal, wherein the transmit control circuit forwards the egress congestion indication signal to the switch fabric, thereby causing the switch fabric to stop sending data to the line card until the egress congestion indication signal is no longer asserted.